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VOL. 15 No. 41

October 8, 1965

Cooperative ECONOMIC INSECT REPORT

Issued by

PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

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SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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Plant Pest Control Division
Agricultural Research Service
United States Department of Agriculture
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Volume 15 October 8, 1965 Number 41

COOPERATIVE ECONOMIC INSECT REPORT

HIGHLIGHTS

THREE-CORNERED ALFALFA HOPPER continues to increase in alfalfa in areas of Arizona and heavy damage reduced yields; SORGHUM MIDGE severe on late-planted sorghums and heavily damaged grain heads in Cochise County. (p.1167). FALL ARMYWORM damaging alfalfa, small grains, pasture grasses and field corn in Missouri, Kansas and Ohio. NORTHERN CORN ROOTWORM severe on corn in areas of Ohio. (p.1155). Large populations of CHINCH BUG still occurring on field corn in west central Ohio. RED-LEGGED GRASSHOPPER causing moderate to heavy damage to soybeans in Maryland. GRASSHOPPERS damaging in southern Wisconsin and egg laying observed in Minnesota. (p. 1156).

CABBAGE LOOPER remains important on broccoli and cabbage on Eastern Shore of Virginia and necessitates frequent controls on lettuce in New Mexico. EUROPEAN CORN BORER occurring in fall potatoes in largest numbers ever observed on Eastern Shore of Virginia. (p. 1159).

Predicted epidemic of SOUTHERN PINE BEETLE in Virginia did not materialize except in few counties. Loss of $400,000 due to this pest indicated in Alabama for 1965. (p. 1161). Increase in infestations of RED-HEADED PINE SAWFLY in Michigan over those of 1964 may indicate buildup. (p. 1162). GYPSY MOTH defoliation in Northeast reported. (p. 1163). MOSQUITOES reported as severe in woodland areas of Wisconsin and heavy in Oklahoma. (p. 1165).

DETECTION

A new United States record reported was a GALL MIDGE (Uleela pisonifolia Felt). Collection of this midge in Everglades National Park, Florida, also is the first record for continental North America. (p. 1164).

New State records reported were a TARSONEMID MITE (Tarsonemus scaurus) and a SPIDER MITE (Schizotetranychus lycurus) from Ohio (p. 1156), and an APHID (Myzocallis elegans) from Utah (p. 1163).

New county and parish records included: SPOTTED ALFALFA APHID (Therioaphis maculata) in Eaton, Ionia, Clinton, Ingham, Jackson, Monroe, Livingston, Washtenaw and Oakland Counties, Michigan, (p. 1157); WALNUT HUSK FLY (Rhagoletis completa) in San Mateo County, California, (p. 1158); EUROPEAN EARWIG (Forficula auricularia) in Larimer County, Colorado, (p. 1166); a MOSQUITO (Culex nigripalpus) in Jefferson Parish, Louisiana, (p. 1165); a NOCTUID MOTH (Phlegetonia delatrix) in Kauai County, a WEEVIL (Brachyrhinus cribricollis) in Maui County, and an ANTHRIBID BEETLE (Araeocorynus cumingi) in Hawaii County, Hawaii, (p. 1171).

CORRECTIONS and ADDITIONAL NOTES

See page 1167.

SPECIAL REPORTS

Status of the Screw-worm in the Southwest. (p. 1170).

Hawaiian Insect Notes. (p. 1171).

Estimated Losses and Production Costs Attributed to Insects and Related Arthropods Attacking Soybeans and Corn (for processing) in Maryland in 1964. (p. 1172).

Corn Insect Survey in Indiana, Fall 1964. (p. 1173).

Reports in this issue are for week ending October 1 unless otherwise indicated.

WEATHER BUREAU'S 30-DAY OUTLOOK

OCTOBER 1965

The Weather Bureau's 30-day outlook for October calls for temperatures to average above seasonal normals in the western half of the Nation except for near to below normal over the southern Plains. Below normal averages are expected over the eastern half with greatest departures in the South and East. Rainfall is expected to be subnormal over the western three-quarters of the Nation except for near normal in the Pacific Northwest and also along the southern border. Elsewhere near normal totals are anticipated except for the South Atlantic States where rainfall is expected to exceed normal.

Weather forecast given here is based on the official 30-day "Resume and Outlook" published twice a month by the Weather Bureau. You can subscribe through the Superintendent of Documents, Washington, D. C. 20250. Price $5.00 a year.

WEATHER OF THE WEEK ENDING OCTOBER 4

HIGHLIGHTS: (1) Another cold week, most areas. (2) Rains light in West, light to heavy East. (3) Record cold September, northern Plains.

TEMPERATURE: It was another cold week in most sections of the 48 States. Only fringe areas, i.e., Florida, south California coast, Pacific Northwest, were near or slightly above normal. In Texas, the Dakotas, and New England weekly averages ranged down to 6° to 9° below normal. The northern Rockies and northern Plains had the 7th consecutive cold week. Fortunately the cold weather pattern broke late in the week as high barometer overspread the country and reminded one of Indian summer. Mild, dry air of Pacific origin moved eastward to the Dakotas. With clear skies and light winds, minimum temperatures were in the 30's and 40's with maximums in the 60's and 70's. Daily temperature ranges as large as 40° were common in the northern Plains late in the week. Drying conditions became excellent over large areas. Freezing temperatures were widespread in almost the entire northern tier of States. In the Rockies and the Plateau region, freezes were general to the southern limits of Utah and Colorado. In the western Corn Belt, the freeze line was farther north than in previous weeks. In much of New England, freezes ended the growing season.

PRECIPITATION: Rain fell mostly during the first 3 or 4 days. A low moved slowly from the northern Rockies to north of the Great Lakes producing 1 to 2 inches over the northern Plains. Tropical storm Debbie moved into the northeastern gulf coast causing heavy rains as far northeastward as Ohio and Pennsylvania. The Brunswick, Georgia, area received more than 10 inches. Very little rain fell elsewhere over the country, except for 1-inch rains in southeast Texas late in the week. In California and parts of Arizona, Nevada, and Oregon this was either the 2d or 3d dry week. (Summary supplied by U. S. Weather Bureau).

CEREAL AND FORAGE INSECTS

CORN EARWORM (Heliothis zea) - MICHIGAN - First large-scale flight of season occurred week ending September 27. Blacklight trap collections very heavy on evenings of September 21 and 22, especially at eastern locations on Lower Peninsula. (See light trap collections, page 1168). Another heavy flight occurred September 28. (Newman). MARYLAND - Larvae heavily damaged pods of soybeans in several late maturing fields near Salisbury, Wicomico County. (U. Md., Ent. Dept.) COLORADO - Damage estimates as high as 70 percent reported on corn in Mesa, Delta and Montrose Counties. (Hantsbarger). Small numbers of adults present on blossoms of rabbitbrush in Larimer County. (Simpson). CALIFORNIA - Causing heavy damage to heads of milo in Tulare County. (Cal. Coop. Rpt.).

FALL ARMYWORM (Spodoptera frugiperda) - KANSAS - Reported damaging seedling alfalfa in south central district. (Reading). OHIO - Infesting ears of field corn in field in western Franklin County; 7 of 25 ears checked had up to 2 late-stage larvae per ear. Corn well past dent stage and ripening. Only 1 larva found in 25 ears checked in another field few miles distant. (Rose). Few larvae noted boring into stalks of corn in fields in Logan County. (Barry). MISSOURI - Larvae damaging some early seedings of small grains, permanent pasture grasses and alfalfa in southwest area. Damage ranges from light to destruction of stand. Larvae in all stages of development. (Wkly. Ins. Rpt.).

SOUTHERN CORNSTALK BORER (Diatraea crambidoides) - VIRGINIA - Severe in field of corn in Charles City County; 95 percent of stalks show evidence of presence of borers although very few borers found at present time. (Isakson, Settle, Sept. 27).

SOUTHWESTERN CORN BORER (Zeadiatraea gradiosella) - ILLINOIS - None found in survey conducted in Randolph and Jackson Counties. (Ill. Ins. Rpt.).

EUROPEAN CORN BORER (Ostrinia nubilalis) - MICHIGAN - Percent plants infested by first and second-brood larvae in 15 fields sampled September 24 and 28, by county, as follows: Ingham, 13 in 5 fields; Jackson, 26 in 5 fields; Clinton, 18 in 5 fields. (Dowdy). SOUTH DAKOTA - Little damage to corn plants evident in Union, Clay, Yankton, Turner and Lincoln Counties. Infestation varied 0-84 percent of stalks infested in fields checked. Borer numbers somewhat similar to those present in 1964. Larvae ranged second to fourth instar, mostly third instar. (Jones). MISSOURI - Infestations rather high in many fields of middle and late season planted corn over northern half of State. These second-generation larvae will continue to cause stalk breakage and ear drop. (Wkly. Ins. Rpt.).

NORTHERN CORN ROOTWORM (Diabrotica longicornis) - MARYLAND - Numerous adults collected from and nearby corn near Keymar, Carroll County. (U. Md., Ent. Dept.). OHIO - Survey conducted August 16 through September 6 in 34 counties. Of 1,614 fields checked, 178 severely infested; beetles ranged 1-18 per plant, lodging varied 0-40 percent, and 63 percent of silks cut off. (Polivka). MICHIGAN - Adults common in alfalfa near infested corn. Averaged 7 and 18 per 20 sweeps in 2 fields of alfalfa in Oakland County September 28. (Newman).

SOUTHERN CORN ROOTWORM (Diabrotica undecimpunctata howardi) - MARYLAND - Larvae caused considerable lodging of corn in central and western Carroll County. (U. Md., Ent. Dept.).

CORN LEAF APHID (Rhopalosiphum maidis) - OHIO - Heavy infestation observed on field corn near Degraff, Logan County. Pollination affected; many ears unfilled in this field. Heavy infestations and barren stalks observed in fields in Shelby and Mercer Counties. (Barry). SOUTH DAKOTA - Ranged 50-75 per stalk in protected areas on corn plants sampled in southeastern area. Majority of aphids noted on inner side of corn husks on cobs in standing corn. (Jones). WISCONSIN - Remains common beneath leaf sheaths of late corn. (Wis. Ins. Sur.).

CHINCH BUG (Blissus leucopterus) - OHIO - Large populations still occurring on field corn in west central area. Particularly heavy infestation observed in Logan County field about 5 miles north of Degraff; largest numbers found in low spots in field, with over 500 individuals noted on some stalks. Corn about 18 inches high. Other heavy infestations observed in fields near McCarthyville and Sidney, Shelby County. (Barry).

SORGHUM MIDGE (Contarinia sorghicola) - CALIFORNIA - Adults heavy locally in fields of milo in Visalia, Tulare County. (Cal. Coop. Rpt.).

TWO-SPOTTED SPIDER MITE (Tetranychus telarius) - OHIO - Extremely heavy infestation on leaves of corn reported from Celeryville, Huron County. Det. by D. Johnston. (Creamer).

A TARSONEMID MITE (Tarsonemus scaurus) - OHIO - Large numbers present on stems, leaves and tassels of corn near Hoytville, Wood County, September 14, 1965. Significance of this heavy infestation uncertain. Det. by D. Johnston. This is a new State record. (Creamer).

GRASSHOPPERS - MARYLAND - Melanoplus femurrubrum (red-legged grasshopper) adults causing moderate to heavy injury to several fields of soybeans in Wicomico County. (U. Md., Ent. Dept.). MICHIGAN - Adults of Melanoplus spp. averaged 0.4 and nymphs 0.2 per 10 sweeps in 18 fields of alfalfa sampled in 7 Lower Peninsula counties September 21, 24 and 28. (Dowdy). WISCONSIN- Grasshoppers feeding on alfalfa, and in some instances corn, in southern half of State. (Wis. Ins. Sur.). MINNESOTA - Grasshoppers observed laying eggs in Wright County. Cool, wet weather reduced activity during week ending September 24. (Minn. Ins. Rpt.). SOUTH DAKOTA - Grasshoppers reported damaging some early winter wheat in Dewey County; damage also noted in late crops in Grant County. (Jones). KANSAS - Preliminary results of fall grasshopper survey indicate absence of any heavy infestations, although average of 25 per square yard in alfalfa noted at one location in Jewell County. Ranged 9-10 per square yard at locations in Clark, Crawford, Neosho and Montgomery Counties. Numbers noneconomic at most other locations. (Thiewes). COLORADO - Weather mostly cold and wet during week ending October 1; temperatures below freezing on several nights apparently caused some grasshopper mortality. (Colo. Ins. Sur.). WYOMING - Cooperative treatments for grasshoppers applied to total of 339,641 acres in State. Acreage treated by county as follows: Washakie 6,630, Johnson 10,941, Goshen 16,145, Platte 4,190, Converse 14,132, Sheridan 287,603. (Spackman). UTAH - Grasshoppers spottedly numerous in some northern localities. Melanoplus sanguinipes (migratory grasshopper) very numerous in area near Cove, Cache County. (Knowlton).

GREEN JUNE BEETLE (Cotinis nitida) - NORTH CAROLINA - Larvae reported damaging lawn in Cleveland County. (Clapp, Robertson).

LEAFHOPPERS - OKLAHOMA - Several species heavy in Bermuda grass lawns in Stillwater, Payne County. (Okla. Coop. Sur.).

A CHINCH BUG (Blissus sp.) - ALABAMA - Isolated infestations and considerable damage occurring on few lawns of St. Augustine grass in Lee and Jefferson Counties. (Pruett et al.).

A SPIDER MITE (Schizotetranychus lycurus) - OHIO - Collected from rice cutgrass in Putnam County September 14, 1965. Det. by D. Johnston. This is a new State record. (Creamer).

PEA APHID (Acyrthosiphon pisum) - MICHIGAN - Adults and nymphs in alfalfa averaged 193 per 10 sweeps in 18 fields checked in Eaton, Ionia, Clinton, Ingham, Jackson, Monroe and Livingston Counties on September 21, 24 and 28. (Dowdy). ARKANSAS - Results of surveys negative in northwest area. (Ark. Ins. Sur.). OKLAHOMA - Light in McCurtain County alfalfa; averaged 5 per 10 sweeps. (Okla. Coop. Sur.). NEW MEXICO - Light to medium numbers noted in alfalfa in Dona Ana and Rio Arriba Counties. (Mathews, Heninger, Kloepfer). UTAH - Very numerous on alfalfa in some Davis County fields. (Knowlton).

SPOTTED ALFALFA APHID (*Therioaphis maculata*) - MICHIGAN - Very small numbers of adults and nymphs collected in Eaton, Ionia, Clinton, Ingham, Jackson, Monroe, Livingston, Washtenaw and Oakland Counties. These are all new county records. Since initial find in State in September, *T. maculata* has been found in 14 counties. Infestations very light in already recorded counties of Calhoun, Branch, St. Joseph, Cass and Van Buren. Data show species widespread over Lower Peninsula as far as, but not yet collected in, Gratiot County. Counts averaged 3.3 per 10 sweeps in 18 fields sampled in Eaton, Ionia, Clinton, Ingham, Jackson, Monroe and Livingston Counties on September 21, 24 and 28. (Dowdy). NEBRASKA - Populations moderate in Dundy, Keith and Sheridan Counties. (Manglitz). OKLAHOMA - Infestations ranged 600-700 per 10 sweeps in alfalfa checked in Jackson County; some spraying underway. Averaged 20 per 10 sweeps in McCurtain County alfalfa. (Okla. Coop. Sur.). ARKANSAS - None found during surveys in northwest area. (Ark. Ins. Sur.).

TARNISHED PLANT BUG (*Lygus lineolaris*) - MICHIGAN - Adults averaged 8.7 per 10 sweeps in 18 fields of alfalfa checked in 7 counties on Lower Peninsula. (Dowdy).

ALFALFA PLANT BUG (*Adelphocoris lineolatus*) - MICHIGAN - Adults averaged 2.9 and nymphs 6.3 per 10 sweeps in 18 fields of alfalfa checked in 7 Lower Peninsula counties September 21, 24 and 28. (Dowdy).

POTATO LEAFHOPPER (*Empoasca fabae*) - MICHIGAN - Adults averaged 10.5 and nymphs 2.7 per 10 sweeps in 18 fields of alfalfa checked September 21, 24 and 28 in 7 Lower Peninsula counties. (Dowdy).

THREE-CORNERED ALFALFA HOPPER (*Spissistilus festinus*) - OKLAHOMA - Averaged 22 per 10 sweeps in alfalfa in McCurtain County; moderate in Payne County. (Okla. Coop. Sur.).

MEADOW SPITTLEBUG (*Philaenus spumarius*) - MICHIGAN - Adults in alfalfa averaged 5.6 per 10 sweeps in 18 fields checked in 7 Lower Peninsula counties September 21, 24 and 28. (Dowdy).

ALFALFA CATERPILLAR (*Colias eurytheme*) - NEW MEXICO - Larvae range 15-18 per 25 sweeps in alfalfa in southern Dona Ana County, with heavy adult flights noted in some fields. (Mathews). ARKANSAS - Moths very numerous in alfalfa in northwest area; larval numbers very low. (Ark. Ins. Sur.). MICHIGAN - Averaged 0.5 per 10 sweeps in alfalfa in 18 fields checked in 7 Lower Peninsula counties. (Dowdy).

GREEN CLOVERWORM (*Plathypena scabra*) - ARKANSAS - Larvae numerous but noneconomic in alfalfa in northwest area; ranged 50-75 per 100 sweeps. (Ark. Ins. Sur.). MICHIGAN - Averaged 0.4 larva per 10 sweeps in 18 fields of alfalfa in 7 Lower Peninsula counties September 21, 24 and 28. (Dowdy).

VELVETBEAN CATERPILLAR (*Anticarsia gemmatalis*) - ALABAMA - Heavy numbers present in late field of peanuts at Tumbleton, Henry County. Light numbers of *Heliothis zea* (corn earworm) also present in this field. (Watson).

WEBWORMS (*Loxostege* spp.) - OKLAHOMA - Reported heavy in young alfalfa in Jackson County; some fields sprayed. (Okla. Coop. Sur.).

LEPIDOPTEROUS LARVAE - SOUTH CAROLINA - Built up in many fields of soybeans, with some fields showing heavy leaf damage; damage heaviest in Allendale and Hampton Counties. Continued inspection of fields more necessary in Savannah Valley than other parts of State. (Nettles et al., Sept. 28).

ALFALFA WEEVIL (*Hypera postica*) - NEW MEXICO - Damage to alfalfa apparent in fields at Ojo Caliente and Abiquiu, Rio Arriba County. (Heninger). OHIO - Activity apparently increasing in eastern area. Averaged 6 larvae per 10 sweeps in alfalfa near Lisbon, Columbiana County. Night collecting in same area showed approximately 3 adults per 10 sweeps. (Niemczyk, Flessel).

CLOVER LEAF WEEVIL (Hypera punctata) - IDAHO - Adults found in lawns and flower beds at Grand View, Owyhee County. (Edwards).

SWEETCLOVER WEEVIL (Sitona cylindricollis) - NEBRASKA - Adults averaged 15 per sweep in field of alfalfa in Lancaster County. (Stevens).

BEAN LEAF BEETLE (Cerotoma trifurcata) - MARYLAND - Adults causing conspicuous foliage in several fields of soybeans in Wicomico County. (U. Md., Ent. Dept.).

FRUIT INSECTS

CODLING MOTH (Carpocapsa pomonella) - OKLAHOMA - Full-grown larvae found in apples in Payne County. (Okla. Coop. Sur.). NEW MEXICO - Light damage noted in Velarde Valley, Rio Arriba County. Controls gave good results in most orchards. (Heninger).

ORIENTAL FRUIT MOTH (Grapholitha molesta) - VIRGINIA - Damaging tops of 6 peach trees in Stafford County. (Isakson, Beck, Sept. 24).

EUROPEAN CORN BORER (Ostrinia nubilalis) - MARYLAND - Few larvae collected September 29 from apple twigs at Princess Anne, Sommerset County. (U. Md., Ent. Dept.).

SAP BEETLES (Carpophilus spp.) - CALIFORNIA - Adult populations of C. hemipterus (dried fruit beetle) and C. humeralis heavy in over-ripe peach fruit in Merced and medium in Le Grand, Merced County. (Cal. Coop. Rpt.).

WALNUT HUSK FLY (Rhagoletis completa) - CALIFORNIA - Larvae medium in peach fruit in Redwood City, San Mateo County. This is a new county record. (Cal. Coop. Rpt.).

APPLE MEALYBUG (Phenacoccus aceris) - NEW HAMPSHIRE - Buildup heavy in orchard at New Hampton. (Conklin, Sept. 24.).

WOOLLY APPLE APHID (Eriosoma lanigerum)- NEW MEXICO - Heavy on some apple trees at Velarde, Rio Arriba County. (Heninger).

PEACH SILVER MITE (Aculus cornutus) - COLORADO - Causing silvering in few Mesa County peach orchards. (Bulla).

SPIDER MITES - COLORADO - Populations of Tetranychus telarius (two-spotted spider mite) and Panonychus ulmi (European red mite) relatively low because of rains and cool temperatures but still active and feeding. Apple harvest under way in Mesa, Montrose and Delta Counties. (Bulla, Hantsbarger).

FALL WEBWORM (Hyphantria cunea) - NEW MEXICO - Medium to heavy on pecan and apple trees, some heavily defoliated. (N. M. Coop. Rpt.). OKLAHOMA - Continues to damage pecan, walnut and other trees in some areas. (Okla. Coop. Sur.). ALABAMA- Quite serious in some orchards in Covington County. (Linder).

WALNUT CATERPILLAR (Datana integerrima) - OKLAHOMA - Full-grown larvae present on pecans in Payne County. (Okla. Coop. Sur.). TEXAS - Probably this species, defoliating pecans in Nacogdoches County. (Hodges).

PECAN WEEVIL (Curculio caryae) - OKLAHOMA - Moderate to heavy on pecans in Cleveland County. (Okla. Coop. Sur.).

A FALSE POWDER-POST BEETLE (Xylobiops basilaris) - ALABAMA - Adults attacking dying and damaged pecan limbs in Jefferson, Lee and other counties. Also infesting an apparently healthy tree in Jefferson County. (McQueen)

APHIDS - ALABAMA - Melanocallis caryaefoliae (black pecan aphid) and Monellia spp. continue heavy and damaging pecans in Baldwin, Clarke, Conecuh, Covington and other southern counties, with considerable defoliation noted. (Turner et al.).

PACIFIC SPIDER MITE (Tetranychus pacificus) - CALIFORNIA - Medium on young almond trees in Paso Robles, San Luis Obispo County. (Cal. Coop. Rpt.).

A FRUIT FLY (Anastrepha suspensa) - FLORIDA - Adult populations built up following apparent reduction by Hurricane Betsy. Recent collections extend known distribution to Clewiston, Hendry County; Homestead, Dade County; Vero Beach, Indian River County. (Fla. Coop. Sur.).

A LABIDURID EARWIG (Euborellia cincticollis) - CALIFORNIA - Populations on citrus light in Reedley and Orange Cove and medium in Sanger, Fresno County. (Cal. Coop. Rpt.).

GRAPE ROOT BORER (Vitacea polistiformis) - ALABAMA - Pupating along ground and next to trunks of several 10-year-old grape plants in Lee County. (McQueen).

TRUCK CROP INSECTS

CABBAGE LOOPER (Trichoplusia ni) - VIRGINIA - Still most important pest of broccoli and cabbage on Eastern Shore. Population approaching another peak; hot, dry weather slowed spread of virus disease. (Hofmaster,Sept. 24.). MARYLAND - This species and Hellula rogatalis (cabbage webworm) moderate on rape planting near Piscataway, Prince Georges County. (U. Md., Ent. Dept.). NEW MEXICO - Larvae and eggs of T. ni on Dona Ana County lettuce, require controls every 4-6 days. (Wayne, Clute). MICHIGAN - Adult flights remain relatively light over Lower Peninsula despite few favorable nights. (Newman).

TOMATO FRUITWORM (Heliothis zea) - MARYLAND - Heavily injured tomato planting near Piscataway, Prince Georges County. (U. Md., Ent. Dept.). VIRGINIA - Increased steadily and damaging snap beans on Eastern Shore. (Hofmaster, Sept. 24). NEW MEXICO- Damage heavy on some cabbage plants in Taos, Taos County. (Heninger).

GRANULATE CUTWORM (Feltia subterranea) - ALABAMA - Light larval numbers girdling some newly transplanted plants in home gardens in central section. (McQueen).

POTATO TUBERWORM (Gnorimoschema operculellum) - VIRGINIA - Well distributed in foliage of fall potatoes on Eastern Shore. Most infestations under control. Treatment of seed potatoes recommended. (Hofmaster, Sept. 24).

IMPORTED CABBAGEWORM (Pieris rapae) - VIRGINIA - Parasitism by braconids extremely high on Eastern Shore; 98 of 100 larvae checked parasitized. (Hofmaster, Sept. 24).

EUROPEAN CORN BORER (Ostrinia nubilalis) - VIRGINIA - Largest numbers ever observed found on fall potatoes on Eastern Shore. Early maturity of field corn contributing factor. (Hofmaster, Sept. 24).

TOMATO HORNWORM (Protoparce quinquemaculata) - OKLAHOMA - Moderate and damaging tomatoes in home gardens in Payne County. (Okla. Coop. Sur.).

MEXICAN BEAN BEETLE (Epilachna varivestis) - ALABAMA - Adults and larvae heavy on peas and snap beans in home gardens in central section. (McQueen). MARYLAND - Heavily injured planting of snap beans at Piscataway, Prince Georges County. (U. Md., Ent. Dept.).

A FLEA BEETLE (Phyllotreta cruciferae) - VIRGINIA - Very numerous on mustard greens, turnip greens, kale, collards, spinach and cabbage on Eastern Shore; over 200 per sweep in one field. (Hofmaster, Sept. 24).

COWPEA CURCULIO (Chalcodermus aeneus) - ALABAMA - Continues serious and damaging in commercial table peas in southeast section. (Glasscock).

A SCARAB (Cotinis sp.) - TEXAS - Damaging tomatoes, okra and sweet peppers in Harris County. (Robeck).

SQUASH BUG (Anasa tristis) - OKLAHOMA - Continues heavy on watermelons in Payne County. (Okla. Coop. Sur.).

HARLEQUIN BUG (Murgantia histrionica) - VIRGINIA - Medium on turnip greens on farm in Isle of Wight County. (Isakson, Stith).

MELON APHID (Aphis gossypii) - CALIFORNIA - Heavy on banana squash in Los Banos, Merced County. (Cal. Coop. Rpt.).

CYCLAMEN MITE (Steneotarsonemus pallidus) - MINNESOTA - Populations high in some fields of everbearing strawberries in central and north central areas during September. Fields treated before planting appeared relatively free of this pest. (Minn. Ins. Rpt., Sept. 24).

A SPIDER MITE (Tetranychus ludeni) - CALIFORNIA - Heavy in tomato plantings in Los Alamitos, Orange County. (Cal. Coop. Rpt.).

COTTON INSECTS

BOLL WEEVIL (Anthonomus grandis) - OKLAHOMA - Infestations remain moderate to heavy on cotton in McCurtain, Choctaw and Bryan Counties; reported light in Payne County. Averaged 16 percent in treated fields in Jackson County and 60 percent in untreated Tillman County fields. (Okla. Coop. Sur.). TEXAS - Heavy locally in College Station area of Brazos County. Light to heavy, widespread populations present in Cottle and King Counties. Scattered, light to heavy infestations reported in Hall County. (Texas Coop. Rpt.).

BOLLWORM (Heliothis zea) - OKLAHOMA - Light to moderate in cotton checked in southwest, south central, southeast, central and north central areas. (Okla. Coop. Sur.). CALIFORNIA - Populations variable throughout Imperial County; range from 2-3 up to 8-10 per 100 plants; up to 50 larvae per 100 plants reported in few instances. (Campbell, Sept. 23). Evident in many fields in San Joaquin Valley; ranged up to 40 and 50 larvae per 100 plants in some instances. Generally, moth activity declined greatly and very few eggs evident. Majority of larvae second stage or larger, indicating declining population. (Leigh, Sept. 23).

CABBAGE LOOPER (Trichoplusia ni) - OKLAHOMA - Larvae moderate in cotton in McCurtain County. No evidence of virus infection noted. (Okla. Coop. Sur.).

OMNIVOROUS LOOPER (Sabulodes caberata) - CALIFORNIA - Present in many fields of cotton in San Joaquin Valley but damage light. (Leigh, Sept. 23). Variable numbers present in some fields in Imperial County but generally of no concern. (Campbell, Sept. 23).

PINK BOLLWORM (Pectinophora gossypiella) - NEW MEXICO - Causing some damage to cotton bolls in extreme southern Dona Ana County. Medium to heavy infestations reported on cotton in southern Eddy County. (Mathews, Kloepfer). OKLAHOMA - Gin trash and lint cleaner inspections positive in Hughes, Okfuskee, Coal, McCurtain and Caddo Counties. (Okla. Coop. Sur.). TEXAS - Very light populations in cotton found in local areas of Brazos County. (Meisch, Hamman, Bergman).

LYGUS BUGS (Lygus spp.) - CALIFORNIA - Populations variable in Imperial County cotton. Numbers economic in some fields but general populations low. (Campbell. Sept. 23). Continue evident in many fields in San Joaquin Valley and high nymphal counts evident in some instances; however, control not practical in most instances as cotton has "cut out" and small bolls have shed. (Leigh, Sept. 23).

STINK BUGS - CALIFORNIA - Euschistus conspersus evident in cotton in western Fresno County; most appear to be diapause individuals and apparently not feeding. (Leigh, Sept. 23). E. servus (brown stink bug) abundant in some Imperial County cotton, but generally not a problem except when migration from fields of milo occurs. (Campbell, Sept. 23).

FOREST, ORNAMENTAL AND SHADE TREE INSECTS

SOUTHERN PINE BEETLE (Dendroctonus frontalis) - ALABAMA - Considerable infestation in Jefferson County; lesser infestations near Piedmont and small infestation in southern part of State. State foresters indicate over $400,000 damage in 1965 where conditions favorable for increased infestations over 1964. (McCullough, Chisum). VIRGINIA - Predicted epidemic did not materialize except in few counties, probably as result of rain throughout high hazard area in July. Aerial survey of Eastern Shore September 3 revealed 36 spot infestations in Accomack County and 5 in Northampton County. Problem area of northern Accomack County now cleared; most infestations in central area of county. Spots range 3-50 trees except on Parramore Island, Accomack County, with 10-acre spot. Spot survey of Goochland and Powhatan Counties September 3 revealed continued activity in same area heavily infested in 1964 but generally obvious slowing of current activity noted in spots showing early season activity. Spots averaged 0.5 acres in number of currently active acres in Amelia County. Survey August 27 from South Boston to Suffolk along State line revealed increasing activity in Buggs Island Lake area east of South Boston but no pine mortality in Franklin or Suffolk areas. Epidemic area in Gloucester and Mathews Counties remains problem because of limited accessibility and markets. Single spot of kill (20-40 trees) noted in Dinwiddie and Prince George County area; 2 spots up to 0.5 acre noted in Hanover County; 4 stands of Virginia and shortleaf pines attacked in Fluvanna County. Adults remain active in Buckingham, Lunenburg, Amelia, Mecklenburg, Halifax, Prince Edward and Nottoway Counties. Three infestations noted in Northampton County. Continues extensive damage in Mathews and parts of Gloucester Counties. Reported in 2 stands in Caroline County. (Va. For. Pest Rpt., Aug. Summ.).

CONIFER BARK BEETLES (Dendroctonus spp.) - VIRGINIA - Infested lobloblly and shortleaf pines in 5 stands in Waverly district. Aerial surveys of known critical areas in Dinwiddie, Prince George and Surry Counties continue. Causing decline or death of Virginia and shortleaf pines on 2 tracts each in Madison and Albermarle Counties; active in 2 tracts of shortleaf and loblolly pines in Halifax and Amelia Counties; active in single pitch pine in Henry County. Infesting shortleaf pines at 2 locations in Rockbridge County; killing 2 loblolly pines in Nansemond County location and 20 trees in location in Accomack County. (Va. For. Pest Rpt., Aug. Summ.).

ENGRAVER BEETLES (Ips. spp.) - VIRGINIA - Killing loblolly and shortleaf pines at 5 locations in Waverly district. Caused death of 1-3 shortleaf pines at 5 spots in Halifax County and killed 1-2 shortleaf pines at 2 spots in Henry County. Responsible for death of several Virginia pines; killing 5 loblolly pines in Westmoreland County and several trees in Middlesex County. (Va. For. Pest Rpt., Aug. Summ.). OHIO - I. pini (pine engraver) collected in red pine plantation at Cambridge, Guernsey County; trees dying. (Share, Holdsworth).

WHITE-PINE WEEVIL (Pissodes strobi) - VIRGINIA - Activity about same as in 1964 in Shenandoah County; widespread and severe in Frederick County. Noted in Augusta and Rockbridge Counties. Scattered damage noted throughout Salem district; varies considerably. (Va. For. Pest Rpt., Aug. Summ.).

PALES WEEVIL (Hylobius pales) - VIRGINIA - Killed 20 percent of 4-acre plantation in Nelson County. (Va. For. Pest Rpt., Aug. Summ.).

FULLER ROSE BEETLE (Pantomorus godmani) - CALIFORNIA - Adults heavy and damaging Norway spruce trees locally in Los Osos, San Luis Obispo County. (Cal. Coop. Rpt.)

NANTUCKET PINE TIP MOTH (Rhyacionia frustrana) - VIRGINIA - Numerous in young loblolly pine plantings in Lunenburg and Amelia Counties. Evident in planted loblolly pine throughout Salem district; infesting 1-25 percent of seedlings. Adults widespread in planted loblolly pines in Page and Frederick Counties; active in shortleaf pines and pitch pine in Shenandoah County. Widespread on all young loblolly pine in Accomack and Northampton Counties; heavy in Caroline County plantings. (Va. For. Pest Rpt., Aug. Summ.).

JACK-PINE BUDWORM (Choristoneura pinus) - MICHIGAN - Seasonal larval defoliation of jack pine very heavy in Otsego, Montmorency, Crawford, Kalkaska, Oscoda, Alcona, Roscommon and Ogemaw Counties. Some tree mortality expected but most trees will recover. (Flink).

BAGWORM (Thyridopteryx ephemeraeformis) - VIRGINIA - Caused moderate defoliation of eastern white pines at several locations in Fauqier County; evident in numerous spots in Lunenburg County. (Va. For. Pest Rpt., Aug. Summ.).

RED-HEADED PINE SAWFLY (Neodiprion lecontei) - MICHIGAN - Scattered larval infestations reported during season in many Upper Peninsula and northern Lower Penisula counties. Increase over 1964 probably indicates buildup. Inspection of plantations urged. (Flink). VIRGINIA - Found on 4 acres of loblolly and shortleaf pines in Farmville district. Larvae active and caused light defoliation on single pitch pine in Bland County. Active on shortleaf pines planted in Wise County; caused light defoliation. (Va. For. Pest Rpt., Aug. Summ.). NORTH CAROLINA - Larvae feeding on some pine seedlings locally in Stokes County. (Scott, Mount).

SPRUCE BUD SCALE (Physokermes piceae) - IDAHO - Damaging Douglas-fir in Moscow. (Portman, O'Keefe). MINNESOTA - Quite frequently found on Colorado and Black Hills spruce trees during season; found in nursery row, but more common on older trees in established plantings. (Minn. Ins. Rpt., Sept. 24).

MITES - IDAHO - Oligonychus ununguis (spruce spider mite) damaging Douglas-fir in Moscow. (Portman, O'Keefe). NORTH DAKOTA - Undetermined spider mites damaged evergreens in Bismarck. (Frye). MICHIGAN - Adults and nymphs of undetermined species caused feeding injury to needles of red pine in northern Lower Peninsula; condition especially noticeable in frosty locations; probably important factor in poor growth in area. (Wallner, Flink).

ELM LEAF BEETLE (Galerucella xanthomelaena) - NEW MEXICO - Damage to elms light in Rio Arriba County. (N. M. Coop. Rpt.). OKLAHOMA - Damage to elms continues in many areas. (Okla. Coop. Sur.). VIRGINIA - Widespread and causing moderate defoliation of American elms in Frederick and Clarke Counties. Va. For. Pest Rpt., Aug. Summ.).

TWIG GIRDLER (Oncideres cingulata) - ALABAMA - Considerable amount of twigs of hickory falling from girdling by adults in Lee, Coosa, Calhoun, Clay and Talladega Counties. (Barwood).

LOCUST BORER (Megacyllene robiniae) - IDAHO - Heavy emergence and flight noted in Pocatello. (Mylroie). OKLAHOMA - Adults emerged and active in Payne County. (Okla. Coop. Sur.).

BOXELDER BUG (Leptocoris trivittatus) - COLORADO - Nymphs and adults abundant on boxelder trees in Fort Collins; movement into homes expected soon. (Simpson). NEW HAMPSHIRE - Adults and nymphs heavy on dying maple at Hollis. (Sutherland, Sept. 23).

LACE BUGS (Corythucha spp.) - MARYLAND - C. cydoniae (hawthorn lace bug) heavy on hawthorn at Bethesda, Montgomery County. (U. Md., Ent. Dept.). OHIO - C. ciliata (sycamore lace bug) and Erythroneura spp. (leafhoppers) causing damage to sycamore leaves in Columbus, Franklin County. (Davidson).

FALL WEBWORM (Hyphantria cunea) - NEW MEXICO - Medium to heavy on poplar, cottonwoods and other trees; defoliation heavy on some trees. (N. M. Coop. Rpt.). COLORADO - Noted on cottonwoods and willows in Mesa County. (Hantsbarger). VIRGINIA - Widespread on sweetgum, black gum, sourwood and white oaks; single trees involved with slight defoliation in Nansemond and Isle of Wight Counties. (Va. For. Pest Rpt., Aug. Summ.).

ORANGE-STRIPED OAKWORM (Anisota senatoria) - VIRGINIA - Medium on ash tree in Henry County. (Isakson, Helland, Sept. 23).

GYPSY MOTH (*Porthetria dispar*) - The following table shows the percent defoliation by State caused by gypsy moth as determined by 1965 survey.

Acreage Defoliated by Gypsy Moth - Summer 1965

State	75 percent or less	75-100 percent	Total
Maine	72	118	190
New Hampshire	6,235	2,216	8,451
Vermont	2,385	518	2,903
Massachusetts	15,907	1,325	17,232
Rhode Island	50	--	50
Connecticut	72,353	13,656	86,009
New York	77,315	71,051	148,366
Totals	174,317	88,884	263,201

(PPC, East. Reg.).

VARIABLE OAK LEAF CATERPILLAR (*Heterocampa manteo*) - OKLAHOMA - Heavy on oaks in Oklahoma City area, Oklahoma County. Unusually light in southeast area. (Okla. Coop. Sur.).

COTTONY-CUSHION SCALE (*Icerya purchasi*) - CALIFORNIA - Medium on liquidambar trees in nursery in Chula Vista, San Diego County. (Cal. Coop. Rpt.).

EUROPEAN ELM SCALE (*Gossyparia spuria*) - COLORADO - Heavy and killing limbs on elms in Wray, Yuma County. (Hantsbarger).

TULIPTREE SCALE (*Toumeyella liriodendri*) - OHIO - Heavy locally on yellow-poplar trees near Logan, Hocking County. Producing crawlers. (Burns).

AN APHID (*Myzocallis elegans*) - UTAH - Heavily infested elm foliage (probably *Ulmus laevis*) at Logan, Cache County, during summer; infestation now low. This is a new State record. Det. as *Tinocallis platani* by Dr. V. F. Eastop. Three species of lady beetles, syrphid fly larvae and green lacewing larvae moderately numerous. (Knowlton).

POPLAR PETIOLE GALL APHID (*Pemphigus populitransversus*) - CALIFORNIA - Adults and nymphs heavy on poplar trees in Livingston, Merced County. (Cal. Coop. Rpt.).

A SYNTOMID MOTH (*Syntomeida epilais jucundissima*) - FLORIDA - Larvae moderately damaged leaves of oleander in nursery at Leesburg, Lake County. (Bentley).

LEAF CRUMPLER (*Acrobasis indigenella*) - ALABAMA - Heavy locally on pyracantha; caused considerable damage to isolated plants in Mobile County. (Seibels).

AZALEA CATERPILLAR (*Datana major*) - FLORIDA - Larvae severely damaging azaleas at Leesburg, Lake County. (Felshaw).

AZALEA LACE BUG (*Stephanitis pyrioides*) - FLORDIA - Adults and nymphs localized and severely damaging leaves of azalea in garden center at Tampa, Hillsborough County. (Hale, Sept. 20).

A WEEVIL (*Brachyrhinus cribricollis*) - CALIFORNIA - Medium on saxifraga in Fresno, Fresno County. (Cal. Coop. Rpt.).

APHIDS - UTAH - *Pterocomma* spp. infesting twig bark of weeping willow and other willows in several areas of Salt Lake County. (Knowlton, Burningham). *P. smithiae* infested weeping willow twig bark at Brigham City, Box Elder County. *Lachnus salignus* spottedly present on some species of willow. *Periphyllus lyropictus* (Norway-maple aphid) continues heavy on Norway maples at Salt Lake City but trees less sticky than in summer. (Knowlton). COLORADO - Various species increasing on shrubs in Fort Collins. (Simpson). MARYLAND - *Stegophylla* sp. injuring foliage of pin oak at Bryans Road, Charles County. (U. Md., Ent. Dept.).

FLORIDA - Adults of Cerataphis variabilis generally infesting leaves of Chinese fan palm in nursery at Davie, Broward County. (Shirah, Sept. 23).

CRAPEMYRTLE APHID (Myzocallis kahawaluokalani) - CALIFORNIA - Medium on crapemyrtle in Redding, Shasta County. (Cal. Coop. Rpt.). FLORIDA - Adults and nymphs localized and severely damaging leaves of crapemyrtle in nursery at Leesburg, Lake County. (Bentley).

OLEANDER APHID (Aphis nerii) - CALIFORNIA - Medium on Asclepias fascicularis on railroad property in Yuba City, Sutter County. (Cal. Coop. Rpt.).

COTTONY MAPLE SCALE (Pulvinaria innumerabilis) - NORTH CAROLINA - Infested several boxwoods in Rockingham County. (Flynt, Mount).

TEA SCALE (Fiorinia theae) - NORTH CAROLINA - Infested camellias in Sampson County. (Futrell, Mount).

Coccids in Florida - All stages of Ceroplastes ceriferus taken on stem of sumac at Bushnell, Sumter County. (Holder, Sept. 23). All stages of Asterolecanium pustulans moderately to severely damaging stem of Euphorbia marginata at Grant, Brevard County. (Levan, Sept. 23) These are new host records for Florida Division of Plant Industry. (Fla. Coop. Sur.). All stages of Saissetia oleae (black scale) severely damaging leaves of fiddleleaf fig in greenhouse at Apopka, Orange County. (Musgrove, Sept. 17). All stages of C. floridensis (Florida wax scale) moderately damaging stem and leaves of English-laurel and all stages of Coccus elongatus localized and moderately damaging stem of Mimosa sp. in nursery at Leesburg, Lake County. (Bentley). Phenacoccus gossypii (Mexican mealybug) severely damaged stem and leaves of copperleaf in garden center at Tampa, Hillsborough County. (Hale, Sept. 20). Phenacaspis cockerelli adults moderately damaging leaves of Bischofia javanica in nursery at Fort Lauderdale, Broward County. (Clinton, Sept. 23). Orthezia insignis (greenhouse orthezia) localized and moderately damaging ardisia at Lady Lake, Lake County. (Bentley, Sept. 9). Aspidiella sacchari lightly damaging stem of Phoenix roebelenii in nursery at Fort Myers, Lee County. (Walsh, Sept. 22). All stages of Fiorinia theae (tea scale) severe on leaves of Camellia sasanqua at Kissimmee, Osceola County. (Kipp, Sept. 22).

A GALL MIDGE (Uleella pisonifolia Felt) - FLORIDA - Collected from galls on Pisonia aculeata by F. C. Craighead March 3, 1961, at Bear Lake Road, Everglades National Park. Det. by R. Gagné. This is a new United States record and the first record from continental North America. (Mead). Species described from P. nigricans in 1912 from St. Vincent Island. (ARS).

INSECTS AFFECTING MAN AND ANIMALS

HORN FLY (Haematobia irritans) - OKLAHOMA - Averaged 50 per head on cattle in Payne County; reported moderate in Noble, Mayes, Cleveland and Bryan Counties. (Okla. Coop. Sur.).

STABLE FLY (Stomoxys calcitrans) - OKLAHOMA - Ranged 1-2 per head on cattle checked in Payne County. (Okla. Coop. Sur.).

HORSE FLIES (Tabanus spp.) - OKLAHOMA - Populations moderate on cattle in Choctaw County. (Okla. Coop. Sur.).

HORSE BOT FLY (Gasterophilus intestinalis) - OKLAHOMA - Numerous about horses in Payne County; causing considerable irritation. (Okla. Coop. Sur.).

HOUSE FLY (Musca domestica) - WYOMING - Adults causing concern to homeowners in Laramie and Goshen Counties. (Marks). UTAH - Recent frosts caused reduction of populations in many localities; however, numbers again increasing moderately. (Knowlton).

FACE FLY (*Musca autumnalis*) - UTAH - Annoying horses at Lewiston, Cache County. (Knowlton).

SOUTHERN BUFFALO GNAT (*Cnephia pecuarum*) - OHIO - Probably this pest, reported annoying horses in Cleveland area of Cuyahoga County. (Bartlett, Holdsworth).

BED BUG (*Cimex lectularius*) - IDAHO - Light infestation observed in house at Coeur d'Alene, Kootenai County. (Stranahan).

PUSS CATERPILLAR (*Megalopyge opercularis*) - SOUTH CAROLINA - First of season reported in Hampton County. (Nettles et al., Sept. 28). NORTH CAROLINA - Caused some concern in Edgecombe County. (Perry, Scott).

MOSQUITOES - NEW HAMPSHIRE - *Culex pipiens* adults moving into homes in numbers. (Mason, Sept. 22). WISCONSIN - Mosquitoes reported severe in woodland areas during warm periods. Heavy rains during past few weeks probably responsible for heavy populations as much water provides breeding areas. (Wis. Ins. Sur.). OKLAHOMA - Adult populations of several species heavy in some areas of Bryan County. (Okla. Coop. Sur.). LOUISIANA - Larval collections in Jefferson Parish during week ending September 24 contained *Aedes sollicitans* (salt-marsh mosquito), *Culex pipiens quinquefasciatus* (southern house mosquito), *C. salinarius*, *C. territans*, *Psorophora confinnis*, *Uranotaenia sapphirina*. Total of 17,922 adults collected in 16 light traps operated during same period in parish; increase in numbers of freshwater, floodwater species, mainly *P. confinnis*, noted following Hurricane Betsy. *Culex nigripalpus* recorded for first time in Jefferson Parish. (Stokes). Larval collections in Jefferson Parish during week ending October 1 contained *A. sollicitans*, *C. p. quinquefasciatus*, *C. salinarius*, *C. territans*, *P. confinnis*, *U. sapphirina*, *Anopheles quadrimaculatus* and *Anopheles crucians*. Light trap collections of adult mosquitoes decreased during same period due to unseasonably cool weather. (Jeff. Parish, Dept. Mosq. Contr.). FLORIDA - Adults of *Aedes* sp., probably *infirmatus*, *Anopheles crucians* and *Anopheles quadrimaculatus* (common malaria mosquito) collected in doghouse at Gainesville, Alachua County, September 30. (O'Berry). Approximately 50 percent of *Anopheles* spp. and all *Aedes* spp. showed signs of blood meals. (Mead). NORTH CAROLINA - Larvae and adults of *Aedes aegypti* (yellow-fever mosquito) abundant around Kernersville, Forsyth County. (Ashton).

TICKS - ALABAMA - Heavy, widespread infestations of unspecified species occurring throughout city of Mobile and Mobile County; annoying dogs and humans; reported plentiful in homes. (Deakle). OKLAHOMA - *Amblyomma americanum* (lone star tick) ranged 0-10 (average less than 1) per head on cattle in Atoka County; only nymphs observed. *Rhipicephalus sanguineus* (brown dog tick) reported heavy on dogs in Payne County. (Okla. Coop. Sur.). VIRGINIA - *R. sanguineus* numerous on dog and around doghouse in yard in Mathews County. (Isakson, Dinwiddie, Sept. 28).

BLACK WIDOW SPIDER (*Latrodectus mactans*) - UTAH - Numerous reports received during past 3 weeks concerning this pest about homes in Salt Lake City area and in Salt Lake County. (Burningham, Knowlton). Single specimen found in one home and several specimens found about foundation and in yard of another home at Logan, Cache County. (Knowlton).

HOUSEHOLD AND STRUCTURAL INSECTS

BOXELDER BUG (*Leptocoris trivittatus*) - UTAH - Heavy numbers entering several homes in area about Bear Lake, Rich County. (Knowlton). WYOMING - Entering homes and causing concern in Torrington, Goshen County, and in Pine Bluffs, Laramie County. (Marks). MICHIGAN - Very few complaints from homeowners concerning this pest. (Janes).

ELM LEAF BEETLE (*Galerucella xanthomelaena*) - OKLAHOMA - Reported entering homes to hibernate in Kay, Noble, Pawnee and Payne Counties. (Okla. Coop. Sur.).

STRAWBERRY ROOT WEEVIL (Brachyrhinus ovatus) - OHIO - Moving into houses and other buildings over much of State. (Craine, Scheetz, Delaplane).

ASIATIC OAK WEEVIL (Cyrtepistomus castaneus) - NORTH CAROLINA - Caused concern to numerous homeowners in many areas of Yadkin County. (Smith, Scott).

SAW-TOOTHED GRAIN BEETLE (Oryzaephilus surinamensis) - OKLAHOMA - Infested stored products in Payne County home. (Okla. Coop. Sur.).

FIELD CRICKETS (Gryllus spp.) - OKLAHOMA - Large numbers continue to move into buildings in some areas of State. (Okla. Coop. Sur.).

EUROPEAN EARWIG (Forficula auricularia) - COLORADO - Reported in home in Fort Collins, Larimer County. This is a new county record. (Hoerner).

MUSHROOM MITE (Tyrophagus putrescentiae) - CALIFORNIA - Adults heavy in and on refrigerator in home in San Diego, San Diego County. Species not so prevalent as in 1964. (Cal. Coop. Rpt.).

CENTIPEDES - WISCONSIN - Very numerous in homes; present in basement and ground floor areas. (Wis. Ins. Sur.).

MILLIPEDS - NEVADA - Moving into homes and causing concern to homeowners at north end of Lake Tahoe, Washoe County. (Coop. Rpt.).

STORED-PRODUCT INSECTS

Stored-Product Insects in Maryland - Large storage of barley on farm near Clarksville, Howard County, heavily infested with varying numbers of Cryptolestes pusillus (flat grain beetle), Sitophilus granarius (granary weevil), Rhyzopertha dominica (lesser grain borer), Pyralis farinalis (meal moth) and Tribolium castaneum (red flour beetle). (Bissell, Sept. 28).

INDIAN-MEAL MOTH (Plodia interpunctella) - IDAHO - This pest and assorted bran bugs caused severe damage to stored corn at Buhl, Twin Falls County. (Peay). UTAH - Infesting grocery store near Salt Lake City. (Knowlton).

ANGOUMOIS GRAIN MOTH (Sitotroga cerealella) - WYOMING - Large numbers of larvae found in popcorn shipped in from out of State and sold in grocery store at Laramie, Albany County. (Robb).

BENEFICIAL INSECTS

LADY BEETLES - MICHIGAN - Adults of various species ranged 1-14 and averaged 5.8 per 10 sweeps in total of 18 alfalfa fields in Eaton, Ionia, Clinton, Ingham, Jackson, Monroe and Livingston Counties. (Dowdy, Sept. 21, 24, 28).

DAMSEL BUGS - MICHIGAN - Adults ranged 0-20 (averaged 6.6) and nymphs ranged 0-6 (averaged 1.4) per 10 sweeps in total of 18 alfalfa fields in Eaton, Ionia, Clinton, Ingham, Jackson, Monroe and Livingston Counties. (Dowdy, Sept. 21, 24, 28). ARKANSAS - Nabis spp. only beneficial insects active on alfalfa in northwest. (Ark. Ins. Sur.).

A RHIPICERID BEETLE (Sandalus sp.) - KANSAS - Adults found on elm trees in Manhattan. Larvae are parasitic on cicadas. (Blocker, Heinrichs).

Beneficial Insects in Cotton - CALIFORNIA - Most beneficial species present in Imperial County cotton, depending upon treatments applied to fields. (Campbell, Sept. 23). Lacewings, melyrid beetles (Collops spp.) and anthocorid bugs very abundant in most cotton checked in San Joaquin Valley; anthocorid bugs very abundant where mite activity high. Pest populations appear quite low where predators highly abundant. Parasites common where aphids evident. (Leigh, Sept. 23).

MISCELLANEOUS INSECTS

EUROPEAN MANTIS (*Mantis religiosa*) - WASHINGTON - Numerous specimens collected by high school students during fall of 1964. Det. by A. B. Gurney. Reported as quite numerous in Spokane area of Spokane County. Apparently was introduced prior to 1964, as reports indicate the species has been observed earlier. This is a new State record. (Telford).

GIANT HORNET (*Vespa crabro germana*) - INDIANA - Collected in Clark County. This is the third collection in the State and a new county record. (Huber).

GYPSY MOTH (*Porthetria dispar*) - NEW JERSEY - Adult males were trapped in Burlington, Camden, Middlesex, Monmouth and Ocean Counties. These are new county records. (PPC East. Reg., Aug. Rpt.).

DERMESTID BEETLES - TEXAS - Large numbers found in mink cages in Titus County. (Neal).

CORRECTIONS

CEIR 15(39): 1128 - EUROPEAN HORNET (Vespa crabro germana) - INDIANA - Note should read as follows: Single specimen taken June 29 by E. Saugstad from house trailer on western edge of New Albany, *Floyd*, County. This is a new State record. (Chandler, Aug. 20). Additional specimen taken in *Washington County*. (Chandler, Sept. 17).

ADDITIONAL NOTES

ARIZONA - THREE-CORNERED ALFALFA HOPPER (*Spissistilus festinus*) continues to increase in alfalfa in Yuma, Graham, Maricopa, Cochise and Pinal Counties; heavy damage in many areas reduced yields. CORN EARWORM (*Heliothis zea*) increasing in Yuma County alfalfa; averaged 70 per 100 sweeps. SORGHUM MIDGE (*Contarinia sorghicola*) severe on late-planted sorghums and caused heavy damage to grain heads in Cochise County. Light on earlier planted sorghums. A WHITEFLY (*Aleurocybotus occiduus*) continues to necessitate treatments in Bermuda grass seed fields in Roll area of Yuma County. BEET ARMYWORM (*Spodoptera exigua*) increasing on lettuce in Yuma and Maricopa Counties; infestations light but show indications of increasing to economic proportions in near future. A FLEA BEETLE (*Systena* sp.)causing moderate to heavy damage to lettuce in Yuma County; light on lettuce in Maricopa County. CABBAGE LOOPER (*Trichoplusia ni*) causing light to moderate damage to vegetables in Yuma and Maricopa Counties; some controls necessary. Adults of a GRASSHOPPER (*Schistocerca vaga*) migrating into lettuce in Yuma County; causing light damage to some fields. BOLLWORM (*Heliothis zea*) infestations decreasing in central area cotton; continue light in Graham, Cochise and Yuma Counties. Some controls used in Maricopa, Pinal, Pima and Yuma Counties. Small number of economic infestations of COTTON LEAF PERFORATOR (*Bucculatrix thurberiella*) continue on cotton in Pima and Yuma Counties; some controls necessary. SALT-MARSH CATERPILLAR (*Estigmene acrea*) increasing and damage to cotton apparent in areas of Pima, Pinal, Maricopa and Yuma Counties; light infestations appearing in Graham and Cochise Counties. New infestations of PINK BOLLWORM (*Pectinophora gossypiella*) continue to be found in cotton in Safford area of Graham County; infestations also found in Marinette, north Buckeye and Little Rainbow Valley areas of Maricopa County. Populations of a PUNCTURE-VINE SEED WEEVIL (*Microlarinus lareynii*) found in Blackwater-Florence area of Pinal County and in Safford Valley area of Graham County. (Ariz. Coop. Sur.).

LIGHT TRAP COLLECTIONS

	Tempera-ture °F.	Precip-itation (inches)	Type of trap (BL = blacklight, I = incandescent, MV = mercury vapor, O = other)	*Agrotis ipsilon* (black cutworm)	*Carpocapsa pomonella* (codling moth)	*Chorizagrotis auxiliaris* (army cutworm)	*Estigmene acrea* (salt-marsh caterpillar)	*Faronta diffusa* (wheat head armyworm)	*Feltia subterranea* (granulate cutworm)	*Heliothis virescens* (tobacco budworm)	*H. zea* (bollworm, corn earworm, tomato fruitworm)	*Loxostege commixtalis* (alfalfa webworm)	*Loxostege similalis* (garden webworm)	*Loxostege sticticalis* (beet webworm)	*Ostrinia nubilalis* (European corn borer)	*Peridroma saucia* (variegated cutworm)	*Prodenia ornithogalli* (yellow-striped armyworm)	*Protoparce quinquemaculata* (tomato hornworm)	*Protoparce sexta* (tobacco hornworm)	*Pseudaletia unipuncta* (armyworm)	*Spodoptera exigua* (beet armyworm)	*Spodoptera frugiperda* (fall armyworm)	*Trichoplusia ni* (cabbage looper)	Crops
KANSAS																								
Garden City 9/23-25			BL			3																		
Hays 9/4,16,23			BL			4																		
MASSACHUSETTS																								
East Wareham 9/8-14			2BL								108									45				
MISSISSIPPI																								
Stoneville 9/24-30	43-82	0.18	2BL	60			4		166	3	1476						157	1		88	291	145	104	
Rolling Fork 9/24-30	44-86	0.60	BL	6			1		117	25	874					1	206		8	51	447	162	304	
Tunica 9/24-30	41-80	0.55	BL	10			3		786	22	899					9	106		4	48	244	119	119	
MICHIGAN (Counties)																								
Berrien 9/27-10/1			BL	12							9				5	4	6			11			11	
Branch 9/27-10/1			BL	8							8				6	3	4			27			2	
Kalamazoo 9/27-10/1			BL	2							3				2	4	2			7			2	
Jackson 9/27-10/1			BL	12							92				3	13	4			37			6	
Livingston 9/27-10/1			BL	19							52				6	11	2			49			7	
Ionia 9/27-10/1			BL	7							62				7	13	3			17			5	
Saginaw 9/27-10/1			BL	4							34				6	2	3			14			4	
Ogemaw 9/27-10/1			BL	4							10				0	5	1			17			1	
Newaygo 9/27-10/1			BL	9							24				4	7	5			23			7	
NEBRASKA																								
Bushnell 9/11-17				13		84					12					15				15		2		
Bushnell 9/18-24				1		17										1		2		4				
Chappell 9/14-20				9		10					3					5	2			3		2		
North Platte 9/15-21				29		33					6					4	1			36		12		
North Platte 9/22-28				77		574					6					33				96		2		
Ogallala 9/13-21				2		5					1					1				1				
Scotts Bluff Expt. Sta. 9/11-17				2		16		1					spp. 14			4				1				
Scotts Bluff Expt. Sta. 9/18-24				4		21										2				2				
OHIO (Counties)																								
Licking 9/24-30			BL	2							29						3			11				
Wayne 9/24,27,-29			BL	3				10			41					4	2			6				
Franklin 9/26-29			BL	5				6			97					6	7			9		6		
SOUTH CAROLINA																								
Clemson 9/11-17			BL	7					6		44					5	153		2	23		201		
Clemson 9/18-24			BL						1		88					5	175			24		159	8	
Charleston 9/20-26	60-91	0.81	BL	7			0		7	1	76					0	0	0	7	6		7	0	
TENNESSEE (Counties)																								
Robertson 9/21-27				4					4		124					8	24		4	4		4		
Cumberland 9/21-27									24		241						32			24				
Knox 9/21-27				8					8		28					4	8		2	20				

LIGHT TRAP COLLECTIONS

	Tempera- ture °F.	Precip- itation (inches)	Type of trap	BL = blacklight I = incandescent MV = mercury vapor O = other *Agrotis ipsilon* (black cutworm)	*Carpocapsa pomonella* (codling moth)	*Chorizagrotis auxiliaris* (army cutworm)	*Estigmene acrea* (salt-marsh caterpillar)	*Faronta diffusa* (wheat head armyworm)	*Feltia subterranea* (granulate cutworm)	*Heliothis virescens* (tobacco budworm)	*H. zea* (bollworm, corn earworm, tomato fruitworm)	*Loxostege commixtalis* (alfalfa webworm)	*Loxostege similalis* (garden webworm)	*Loxostege sticticalis* (beet webworm)	*Ostrinia nubilalis* (European corn borer)	*Peridroma saucia* (variegated cutworm)	*Prodenia ornithogalli* (yellow-striped armyworm)	*Protoparce quinquemaculata* (tomato hornworm)	*Protoparce sexta* (tobacco hornworm)	*Pseudaletia unipuncta* (armyworm)	*Spodoptera exigua* (beet armyworm)	*Spodoptera frugiperda* (fall armyworm)	*Trichoplusia ni* (cabbage looper)	Crops
TEXAS																								
Waco 9/25-10/1			BL	4			3		98	18	93					44	29			30	8	13	48	
WISCONSIN																								
De Forest 9/21-27			BL								33				0	6				8				
Hancock 9/23-26			BL	2							8				0	0				7				
Madison 9/24-30			BL	33							75				0	21				67				
Middleton 9/24-30			BL	0							29				0	7				4				
WYOMING																								
Cheyenne 9/13-19				9		159										14				29				
Laramie 9/1-7						14										1				6				
Laramie 9/8-14				3		40														9				

STATUS OF THE SCREW-WORM (Cochliomyia hominivorax) IN THE SOUTHWEST

During the period September 26 - October 2 a total of 19 cases was reported in the Southwestern Eradication Area by States and counties as follows: TEXAS - Presidio 3, Uvalde 1; NEW MEXICO - Grant and Hidalgo 1 each; ARIZONA - Graham 3, Pima 4, Santa Cruz 2, Greenlee, Pinal, Gila and Cochise 1 each. The Republic of Mexico reported 334 cases; Territorio sur de Baja California 47, Coahuila 25, Veracruz 14, Sonora 92, Chihuahua 46, Durango 66, Tamaulipas 5, San Luis Potosi 7, Mexico 4, Chiapas 9; Oaxaca, Jalisco and Guerrero 3 each; Baja California, Puebla and Yucatan 2 each; Nuevo Leon, Morelos, Hidalgo and Michoacan 1 each. Sterile screw-worm flies released: Texas 18,566,250, New Mexico 5,820,000, Arizona 18,534,000 and the Republic of Mexico 57,844,000.

	Positive Cases		Negative Cases		Ratio of Positive Cases to 100 Cases Negative	
Year	Current	Cumulative	Current	Cumulative	Current	Cumulative
	Table 1. Comparison of specimens reported during corresponding week in 1963 and 1964 in Southwestern Eradication Area. (1965 area figures include cases reported from Arizona and/or California; 1964 figures reflect those from the 5-State area).					
1963	578	3906	142	5309	407.04	73.57
1964	5	112	122	4703	4.09	2.38
1965	19	781	44	3981	43.18	19.61
	Table 2. Comparison of specimens reported during corresponding week and in a corresponding area in 1964 in the United States-Mexico Barrier Zone.*					
1964	203	2727	16	1540	1268.75	177.07
1965	236	4115	46	1812	513.04	227.09
	Table 3. Specimens determined in Mexico south of Barrier Zone.					
1965	116					

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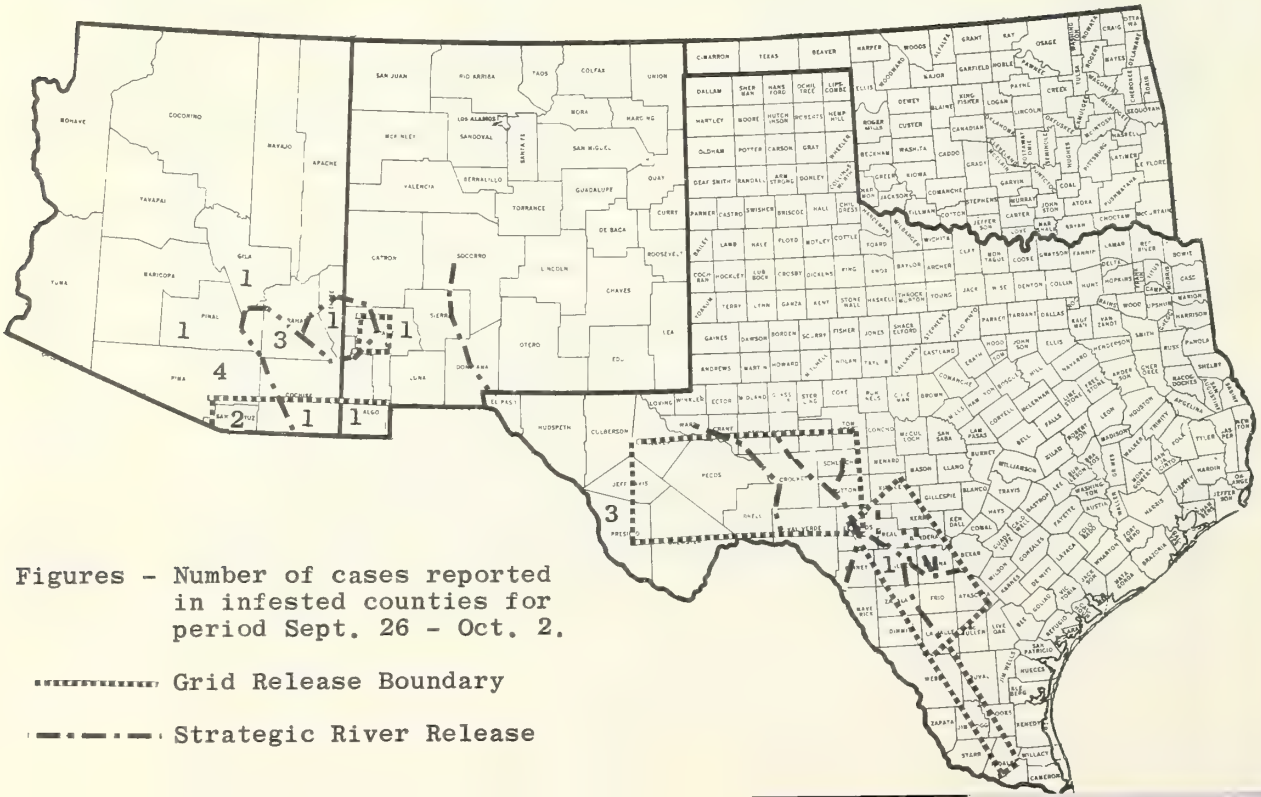
* Barrier Zone - Area in which screw-worm eradication operations are being carried out in an effort to prevent establishment of self-sustaining screw-worm populations in the United States. (Anim. Health Div.).



Figures - Number of cases reported in infested counties for period Sept. 26 - Oct. 2.

▪▪▪▪▪▪▪▪▪▪▪ Grid Release Boundary

— · — · — Strategic River Release

HAWAIIAN INSECT NOTES

The following notes on Hawaii insect conditions were presented at the meeting of the Hawaiian Entomological Society held in September 1965.

Large numbers of adults of a NOCTUID MOTH (Phlegetonia delatrix (Guenee)) were reported on Vitex trifolia plants along the shoreline at Mana, Kauai, by Stephen Au. This constitutes a new county record as well as a new island record. (Mabel Chong). P. delatrix was reported for the first time from Hawaii in CEIR 15(26):704. (PPC).

A PTEROMALID WASP (Spalangia endius Walker), introduced from California in October 1964 to aid in control of Musca domestica L. (house fly), is now established in Ewa, Oahu. Specimens reared from M. domestica puparia collected April 28, 1965, were determined by B. D. Burks. (Mabel Chong).

A CERAMBYCID BEETLE (Plagiohammus spinipennis Thomson) - Recovery of 5 adults of this beetle at night was reported by Dr. Ken Harley at Kukui Paddock in August 1965. This is the first record of field adults in the State. (C. J. Davis). Originally introduced into State in April 1960 for control of lantana. (PPC).

A LEAF MINING HISPID (Uroplata girardi Pic) was recovered for the first time on Mt. Tantalus on September 13, 1965, by Maurice Hironaka. This confirms an earlier finding reported by Dr. J. W. Beardsley. Considerable mining and feeding damage on lantana was observed and adults were present. This beetle was introduced from Brazil in 1961 and is well established in Lawai Valley, Kauai. (C. J. Davis).

A WEEVIL (Brachyrhinus cribricollis (Gyll.)) was reported established on Maui by Nobuo Miyahira. Damage by this weevil reported by a commercial flower grower in Upper Kula (4,000 feet elevation) to leaves, flower buds and blossoms of chrysanthemum was confirmed by Mr. Miyahara. Approximately 40 percent of flower buds were damaged. Specimens were confirmed by Miss Mabel Chong. This is the first report of this pest on Maui and is a new record for Maui County. This weevil was previously known in the State only from Kamuela, Hawaii, where it was discovered in June 1960. (Haw. Ent. Soc. Proc. 18(1): 24, 189). (C. J. Davis).

Several adults of an ANTHRIBID BEETLE (Araeocorynus cumingi Jekel) were intercepted in a shipment of Mucuna sp. seeds in mail destined for out of State on August 25, 1965. G. Fukumura and S. Matayishi, State inspectors, were positive the seeds originated from the island of Hawaii, although the exact locality is unknown. This constitutes a new record for the island of Hawaii as well as a new record for Hawaii County. (E. S. Shiroma).

A specimen of an ARMORED SCALE (Neopinnaspis harperi McKenzie) was intercepted on avocado (Persea sp.) fruit in ship's stores from Hawaii (probably Oahu) on June 13, 1963, at Seattle, Washington. This is the second report of the occurrence of this scale in Hawaii and constitutes a new host record. Dr. J. W. Beardsley first reported this armored scale at the February 1965 meeting of the Hawaiian Entomological Society as being collected on Gouldia terminalis. (See CEIR 15(11):182). Determination was by R. F. Wilkey. (E. S. Shiroma).

A heavy larval infestation of a PHYCITID MOTH (Cryptoblabes aliena Swezey) was present in experimental sweet corn plots at the Waimanalo Experiment Station on Oahu. The larvae had spun fine silken tunnels and were feeding on pollen in the tassels on which webbing was plainly evident. Although the larvae were abundant, they did not appear to reduce pollination. This moth was first reported by Dr. O. H. Swezey in 1905 and damage to sweet corn was reported by him in 1906. The planting at Waimanalo was also heavily infested with Peregrinus maidis (Ashmead) (corn planthopper). Similar conditions were reported by Swezey in 1906. (W. C. Mitchel).

ESTIMATED LOSSES AND PRODUCTION COSTS ATTRIBUTED TO INSECTS AND RELATED ARTHROPODS

IN Maryland (State or District) DURING 1964 (Year)

ATTACKING Soybeans (Commodity or Crop)

A. Pest or pest complex: Thrips, spider mites, bean leaf beetle, Mexican bean beetle, corn earworm.

B. Number of acres [a] produced (From CRS) No. 239,000

C. Average yield per acre [a] (From CRS) Units/ 17.5 bu.

D. Price[b] per unit (bu.)[c] (From CRS) $/ 2.60

E. Acres [a] needing control No. 40,000

F. Acres [a] treated No. less than 1,000

G. Reduction due to not treating where needed:

H. Loss in yield, percent % 5

I. Loss in yield, units per acre [a], C x H Units/ 0.88 bu.

J. Loss in yield, $ per acre [a], D x I $/ 2.29

K. Loss in quality, $ per ---- [a] $/ -----

L. Yield loss for all acres [a], (E-F) x I Units 35,200 bu.

M. Control cost, $ per ---- [a], $/ ----

N. Control cost for all ---- [a], F x M $ ----

O. Yield loss for all acres [a], (E-F) x J $ 91,600

P. Quality loss for all ---- [a], (E-F) x K $ ----

Q. Combined control cost and losses, N + O + P $ 91,600 *

R. Percent loss due to each insect in the complex: Spider mites and bean beetles 50; others 50

Comment: * Estimate does not include loss from reduction in quality. Cost of control not considered since less than 1,000 acres were treated.

a. Acres, head of cattle or other producing units used by Crop Reporting Service.

b. Season average price per unit as given by CRS (describe basis).

c. Bushels, boxes, tons or other marketing units used by CRS; show which in ( ).

Submitted by Wallace C. Harding, Jr.

Date June 22, 1965

ATTACKING Corn (for grain) (Commodity or Crop)

A. Pest or pest complex: Aphids, cutworms, root webworms, European corn borer, fall armyworm, corn earworm.

B. Number of acres [a] produced (From CRS) No. 432,000

C. Average yield per acre [a] (From CRS) Units/ 63 bu.

D. Price[b] per unit (bu.)[c] (From CRS) $/ 1.30

E. Acres [a] needing control No. 120,000

F. Acres [a] treated No. 5,000

G. Reduction due to not treating where needed:

H. Loss in yield, percent % 10

I. Loss in yield, units per acre [a], C x H Units/ 6.3 bu.

J. Loss in yield, $ per acre [a], D x I $/ 8.19

K. Loss in quality, $ per ---- [a] $/ ----

L. Yield loss for all acres [a], (E-F) x I Units 724,500 bu.

M. Control cost, $ per acre [a], $/ 3.00

N. Control cost for all acres [a], F x M $ 15,000

O. Yield loss for all acres [a], (E-F) x J $ 941,850

P. Quality loss for all ---- [a], (E-F) x K $ ----

Q. Combined control cost and losses, N + O + P $ 956,850 *

R. Percent loss due to each insect in the complex:

Comment: * Estimate does not include loss from reduction in quality.

a. Acres, head of cattle or other producing units used by Crop Reporting Service.

b. Season average price per unit as given by CRS (describe basis).

c. Bushels, boxes, tons or other marketing units used by CRS; show which in ( ).

Submitted by Wallace C. Harding, Jr.

Date June 22, 1965

CORN INSECT SURVEY IN INDIANA IN 1964

Ray T. Everly, Ralph A. Bram, David L. Matthew, Jr.
and Edward S. Saugstad
Purdue University

The fall corn insect survey in Indiana in 1964 indicated marked increases in all the insects covered by the survey. The European corn borer (Ostrinia nubilalis) populations almost doubled, the corn earworm (Heliothis zea) increased although not to the point of causing severe losses except in southern areas, and the corn leaf aphid (Rhopalosiphum maidis) was more abundant than in 1963, the year of heaviest infestation since it has been included in the survey. The Angoumois grain moth (Sitotroga cerealella) showed a decided increase with field infested corn found in the northern counties. Damage from bird feeding decreased slightly.

The yield of dent corn in Indiana dropped in 1964 from an average of 87 bushels per acre in 1963 to only 72 bushels in 1964. Yield estimates from observations in the surveyed fields indicated no areas of exceptional yield as were found in 1963. Good yields were observed in the north-northwest and north-north central, the south central and the south-southwest and south-south central areas. The excessive dry conditions of late summer resulted in earlier maturing of the corn plants so that the survey was started one week earlier to avoid loss of information due to early harvested fields. This extreme drought condition may also have contributed to the increased losses from insects, particularly the corn leaf aphid. Stalk rot was quite scarce although considerable breakage showed up later in the fall.

Bird damage was estimated in the same way as in 1963 (Everly and Matthew). Data from this phase of the survey are given in Table 1. Losses were reduced in all areas except the north-northwest where there was a slight increase. The rapid maturing of the ears due to the dry conditions may have made the corn less attractive to the birds. The greatest reduction occurred in the north-northeast area. Large reductions in losses occurred also in the south-southwest, south-south central and south-southeast areas. The average loss from bird feeding in Indiana in 1964 was 0.2 percent compared with 0.5 percent in 1963.

European corn borer populations are given in Table 2. Increases occurred in all areas except the southwest and south central ones, where they declined 8.2 and 9.1 borers per 100 plants respectively. The greatest increases occurred in the north-north central area, 102.4 borers per 100 plants in 1964 compared with 45.8 in 1963, and in the south-south central area, 119.2 in 1964 and 35.1 in 1963. Considerable increases also occurred in the northwest, north central and northeast areas. The average percent of plants infested in 1964 was 35.2, an increase of 10.5 percent over 1963. State populations per 100 plants increased to 59.7, more than double the 1963 population of 28.9. The average loss in grain corn was 1.8 percent in 1964, an increase of 0.7 percent over 1963.

Corn earworm populations, while showing increases in nearly all areas, were still at a subeconomic level. This is undoubtedly associated with the late appearance of large numbers of corn earworm moths. Data from 20 light traps throughout Indiana indicated that corn earworm moths did not occur with any regularity or abundance until August 10 in the southern half of the State, and as late as September 1, were never abundant in the northern half of the State. The abundance and losses from corn earworm are presented in Table 3, along with the dates of earliest appearance and continuous flights as determined from the light trap collections. The percent of fields in which corn earworm damage was found doubled over that of 1963, while the percent of plants infested increased from 2.0 in 1963 to 9.7 in 1964. Damage based on percent of kernels destroyed increased from 0.1 percent in 1963 to 0.3 percent in 1964. The light trap data on earliest appearance, continuous flight and average numbers caught, indicated that corn earworm populations built up in the extreme southwest part of the State and decreased more or less uniformly to the north and east.

The corn leaf aphid populations increased to a new high in Indiana in 1964 (Table 4). Practically every field surveyed (99.7 percent) had aphid infested plants. The plants infested increased from 53.8 percent in 1963 to 65.4 percent in 1964. All of this increase occurred in the severely and moderately infested plants. However, the increase in these two classes of infestation was not uniform throughout the State. In the north-north central area, this increase was from 3.2 percent to 16.0 for the severely infested plants and from 19.2 to 35.3 percent for the moderately infested plants. Similar major increases occurred in the areas where the heaviest losses were found, the north-northeast, north central and northeast areas. The greatest loss in yield, 24.4 percent, was found in the northeast area. This heavy loss in the northeast area was contributed by the high percent of barren plants (14.2) and the largest percentage of nubbin ears (20.4). In this area, considerable acreage was treated by airplane at tassel emergence. The northwest area, while showing the highest percent of plants infested (96.3), had little loss, as the infestation was restricted largely to lightly infested plants (86.5 percent). Undoubtedly, the severe drought conditions of late July and August augmented the losses associated with the corn leaf aphid infestation, as the severe drainage of plant juices by the feeding of the aphids while the plants were under more or less water stress, probably contributed to the increase of smaller ears and reduction in ear size of apparently normal ears. The average loss in yield in 1964 was 9.0 percent compared with 3.6 percent in 1963.

The Angoumois grain moth showed a wider distribution than in past years in Indiana although abundance was limited. Field infested ears were obtained in fields as far north as Porter, Kosciusko, and De Kalb counties. Field infestations were also found in Delaware, Gibson, Posey, Vanderburgh, Daviess, Jackson, Harrison, Floyd, Ripley and Ohio Counties. However, these southern infestations are normal and occur regularly except in years of severe low winter temperatures. Losses due to field infestations were minor except in the south-south central area, where a loss of 2.03 percent occurred. The average loss for the State in 1964 was 0.19 percent compared with less than 0.10 last year. Field infestations are usually never a source of great loss, and are of importance only as a source of infestation for developing populations when the corn is stored.

The summarization of losses, both in bushels and monetary value, are given in Table 6. These losses are based upon the yields of corn in each county for grain supplied by the Statistical Reporting Service, USDA. Since both European corn borer losses and corn leaf aphid losses are nonproduction losses, the gross area yields were corrected for these and the percent losses for all four insects applied directly to these corrected yields. For example, the gross yield reported for the north-northwest area was 42,549,800 bushels. In this area, the European corn borer and corn leaf aphid caused an estimated loss of 14.1 percent. Dividing the production by the compliment of 14.1 percent, we obtain an estimated yield of 49,534,100 bushels in the absence of these two insects. The percent losses from each of these insects was then applied to this expected yield to get the bushels lost from each. The total bushel loss in Indiana in 1964 was estimated at 48,471,000 bushels with a value of $55,741,700.

Table 1. Crop condition, ear size and bird damage. Fall corn insect survey, Indiana, 1964

Area	Counties	Fields	Yield estimate	Maturity a/	Ear Size b/	Bird Damage: Fields attacked	Bird Damage: Plants attacked	Bird Damage: Loss 1963	Bird Damage: Loss 1964
	No.	No.			No.	Pct.	Pct.	Pct.	Pct.
NNW	7	20	Good	Green-dry	690	25.0	9.8	.4	.6
NNC	5	12	Good	Green-dry	706	17.0	2.7	.6	.1
NNE	6	13	Fair	Green	660	46.0	7.7	1.4	.1
NW	6	16	Fair +	Green-dry	689	50.0	5.0	.3	.2
NC	8	16	Fair +	Green-dry	688	56.0	7.2	.1	.1
NE	10	19	Good -	Green-dry	710	32.0	4.0	.2	.0
SW	8	15	Fair	Green-dry	648	53.0	8.0	.5	.2
SC	7	11	Good	Green-dry	711	73.0	12.0	.3	.3
SE	9	18	Good -	Green	697	78.0	11.1	.9	.2
SSW	10	24	Good	Green-dry	730	17.0	3.5	.6	.1
SSC	8	13	Good	Dry	747	23.0	2.5	.6	.1
SSE	8	12	Fair +	Green-dry	692	25.0	4.3	.4	.0
AVERAGES									
NN	18	45	Good -	Green-dry	585	27.7	6.7	.8	.3
N	24	51	Fair +	Green-dry	696	46.0	5.4	.2	.1
S	24	44	Good -	Green-dry	685	68.0	10.4	.6	.2
SS	26	49	Good	Green-dry	723	21.7	3.4	.5	.0
West	31	75	Good -	Green-dry	689	35.0	6.6	.4	.3
Central	28	52	Good	Green-dry	713	42.2	6.1	.4	.2
East	33	62	Fair +	Green-dry	690	45.2	6.8	.7	.1
State	92	189	Good -	Green-dry	697	40.8	6.5	.5	.2

a/ Green-dry indicates dry leaves and stalks still green and succulent.
b/ Kernels per ear.

Table 2. European corn borer abundance and damage. Fall corn insect survey, Indiana, 1964.

	Fields infested		Plants infested		Borers per 100 plants		Loss	
Area	1963	1964	1963	1964	1963	1964	1963	1964
	Pct.	Pct.	Pct.	Pct.	No.	No.	Pct.	Pct.
NNW	100	95.0	58.6	53.1	72.5	93.6	2.2	2.9
NNC	100	100.0	44.8	58.0	45.8	102.0	1.4	3.1
NNE	80	69.2	25.6	33.5	46.4	51.8	1.4	1.6
NW	93	93.8	18.9	41.6	18.5	40.6	.6	1.2
NC	75	81.2	13.2	19.8	13.6	32.5	.4	1.0
NE	84	78.9	14.1	19.6	16.2	34.8	.5	1.1
SW	69	93.3	30.3	22.1	49.9	32.0	1.5	1.0
SC	54	72.7	18.9	9.8	18.2	11.8	.6	.4
SE	31	83.3	12.8	28.9	15.6	39.8	.5	1.2
SSW	100	100.0	35.5	46.3	62.4	95.8	1.9	2.9
SSC	100	92.3	30.7	51.7	35.1	119.2	1.0	3.6
SSE	100	100.0	30.9	38.3	34.5	62.7	1.0	1.9
Averages								
NN	93	88.1	43.0	48.2	42.8	82.5	1.7	2.5
N	84	84.6	15.4	27.0	23.0	36.0	.5	1.1
S	51	86.4	20.7	20.3	27.8	27.9	.9	.9
SS	100	97.4	32.4	45.4	22.1	92.6	1.3	2.8
West	90	95.5	35.8	40.8	45.1	65.5	1.6	2.0
Central	82	86.6	26.9	34.8	24.6	66.4	.8	2.0
East	74	82.8	20.8	30.1	17.2	47.3	.8	1.4
State	82	89.1	24.7	35.2	28.9	59.7	1.1	1.8

Note: The heaviest infested field was located in Daviess County (SSW) with 92% of the corn plants infested, 506 borers per 100 plants and an estimated loss of 15.2%.

Table 3. Corn earworm infestation and damage, and moth captures at light traps in area. Fall corn insect survey, Indiana, 1964.

Area	Fields infested		Plants infested		Loss		Moth captures		
	1963	1964	1963	1964	1963	1964	Earliest first capture	Earliest start of continuous flight	Average caught per day traps operated
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Date	Date	Number
NNW	0	35	0.	9.6	0.	.5	8/2	8/19	1.0
NNC	0	8	0.	4.0	0.	.4	8/10	none	.4
NNE	0	31	0.	5.5	0.	.1	8/4	8/24	.5
NW	67	56	2.4	8.0	.1	.1	7/2	8/21	2.3
NC	12	31	.5	2.2	.0	.0	7/6	8/22	2.5
NE	10	32	.2	5.7	.0	.1	7/25	8/24	1.0
SW	25	80	6.2	17.6	.2	.4	5/27	8/13	2.2
SC	14	64	1.4	10.9	.0	.2	----	----	---
SE	0	72	0.	13.8	0.	.3	8/3	8/12	3.6
SSW	40	75	2.4	14.8	.0	.4	5/3	7/20	16.3
SSC	57	62	8.4	12.0	.3	.2	4/30	8/11	12.3
SSE	44	58	3.3	12.7	.1	.4	5/20	8/25	3.4
Averages									
NN	0	25	0.	6.4	0.	.2	8/2	8/19	.6
N	30	40	1.0	5.3	.0	.1	7/2	8/21	1.6
S	13	72	2.5	14.1	.1	.3	5/27	8/12	2.9
SS	47	65	4.7	13.2	.1	.3	4/30	7/20	10.7
West	33	62	2.8	12.5	.1	.4	5/3	7/20	7.3
Cent.	21	41	2.6	7.3	.1	.2	4/30	8/11	5.1
East	14	48	.9	9.4	.0	.3	5/20	8/12	2.1
State	23	50	2.0	9.7	.1	.3	----	----	---

Table 4. Corn leaf aphid abundance and damage. Fall corn insect survey, Indiana, 1964.

Area	Fields infested		Plants infested		Infestation			Damage								Losses	
								Barren plants				Nubbin ears					
	1963	1964	1963	1964	Se-vere	Mod-erate	Light	Se-vere	Mod-erate	Light	None	Se-vere	Mod-erate	Light	None	1963	1964
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.
NNW	100	100	64.0	70.0	5.2	26.4	39.0	1.0	1.4	.5	0.	2.6	9.2	4.6	0.	4.1	11.2
NNC	90	100	65.6	83.0	16.0	35.3	31.7	2.3	1.7	.3	0.	9.0	11.7	3.7	.7	3.9	16.5
NNE	90	100	53.6	81.9	12.6	43.1	26.2	2.7	1.2	0.	0.	5.2	17.2	2.2	.6	2.3	17.2
NW	100	100	66.9	96.3	1.6	8.2	86.5	---	---	---	---	---	---	---	---	1.0	4.5
NC	100	100	62.1	66.7	11.5	29.0	26.2	6.2	.5	0.	0.	4.5	9.5	1.2	0.	.3	14.3
NE	100	100	43.6	70.7	22.5	31.2	17.0	10.1	2.5	.6	0.	7.8	10.9	1.7	.2	.5	24.4
SW	85	100	58.2	82.7	.3	9.1	73.3	---	---	---	---	---	---	---	---	8.7	4.0
SC	82	100	54.9	42.1	7.6	18.9	15.6	1.4	0.	0.	0.	8.4	1.8	0.	0.	7.9	6.5
SE	100	100	62.4	28.5	3.6	12.7	12.2	---	---	---	---	---	---	---	---	4.9	1.0
SSW	88	96	39.5	48.5	7.3	14.0	37.2	1.0	0.	.3	.2	1.7	1.7	.7	.2	8.8	3.0
SSC	78	100	36.0	58.8	5.5	10.2	43.1	2.1	.6	.9	0.	0.	.9	.6	0.	.0	4.3
SSE	82	100	39.6	55.4	1.7	9.0	44.7	.3	.7	1.0	2.3	.7	1.0	1.3	.3	.9	1.4
Averages																	
NN	94	100	61.1	78.5	11.3	34.9	32.3	2.0	1.1	.3	0.	5.6	12.7	3.5	.4	3.8	15.0
N	100	100	57.5	77.9	11.9	22.8	43.2	8.2	1.5	.3	0.	6.2	10.2	1.4	.1	.6	14.4
S	90	100	58.4	51.1	3.7	13.6	33.7	---	---	---	---	---	---	---	---	7.2	3.8
SS	84	99.3	36.7	54.2	4.8	11.1	38.3	1.1	.4	.7	.8	.8	1.2	.9	.2	3.2	2.9
West	93	99	57.3	74.5	3.6	14.4	56.5	1.0	.7	.4	.1	2.2	5.4	2.6	.1	5.0	5.7
Central	89	100	53.8	62.8	10.2	23.4	29.2	3.0	.7	.6	0.	5.5	6.0	1.4	.2	3.0	10.4
East	95	100	50.6	59.1	10.1	24.0	25.0	4.4	1.5	.5	.8	4.6	9.7	1.7	.4	2.2	11.0
State	93	99.7	53.9	65.4	7.9	20.6	36.9	3.0	1.0	.3	.2	4.4	5.3	1.8	.2	3.6	9.0

Table 5. Angoumois grain moth, abundance and amount of damage to corn infested in the field. Fall corn insect survey, Indiana, 1964.

Area	Fields infested	Ears infested	Loss	
			1963	1964
	Percent	Percent	Percent	Percent
NNW	10.0	2.0	0.	.02
NNC	9.1	1.8	0.	.01
NNE	7.7	1.5	0.	.01
NW	0.	0.	0.	
NC	0.	0.	0.	0.
NE	17.6	3.5	0.	0.
				.04
SW	0.	0.	0.	0.
SC	0.	0.	0.	0.
SE	0.	0.	0.	0.
SSW	22.7	5.4	.2	.06
SSC	25.0	16.7	.03	2.03
SSE	18.2	3.6	0.	.04
Averages				
NN	8.9	1.8	0.	.01
N	5.9	1.2	0.	.01
S	0.	0.	0.	0.
SS	22.0	8.6	0.	.71
West	8.2	1.8	.0	.02
Central	8.5	4.6	0.	.36
East	10.9	2.2	0.	.04
State	9.2	2.9	.0	.19

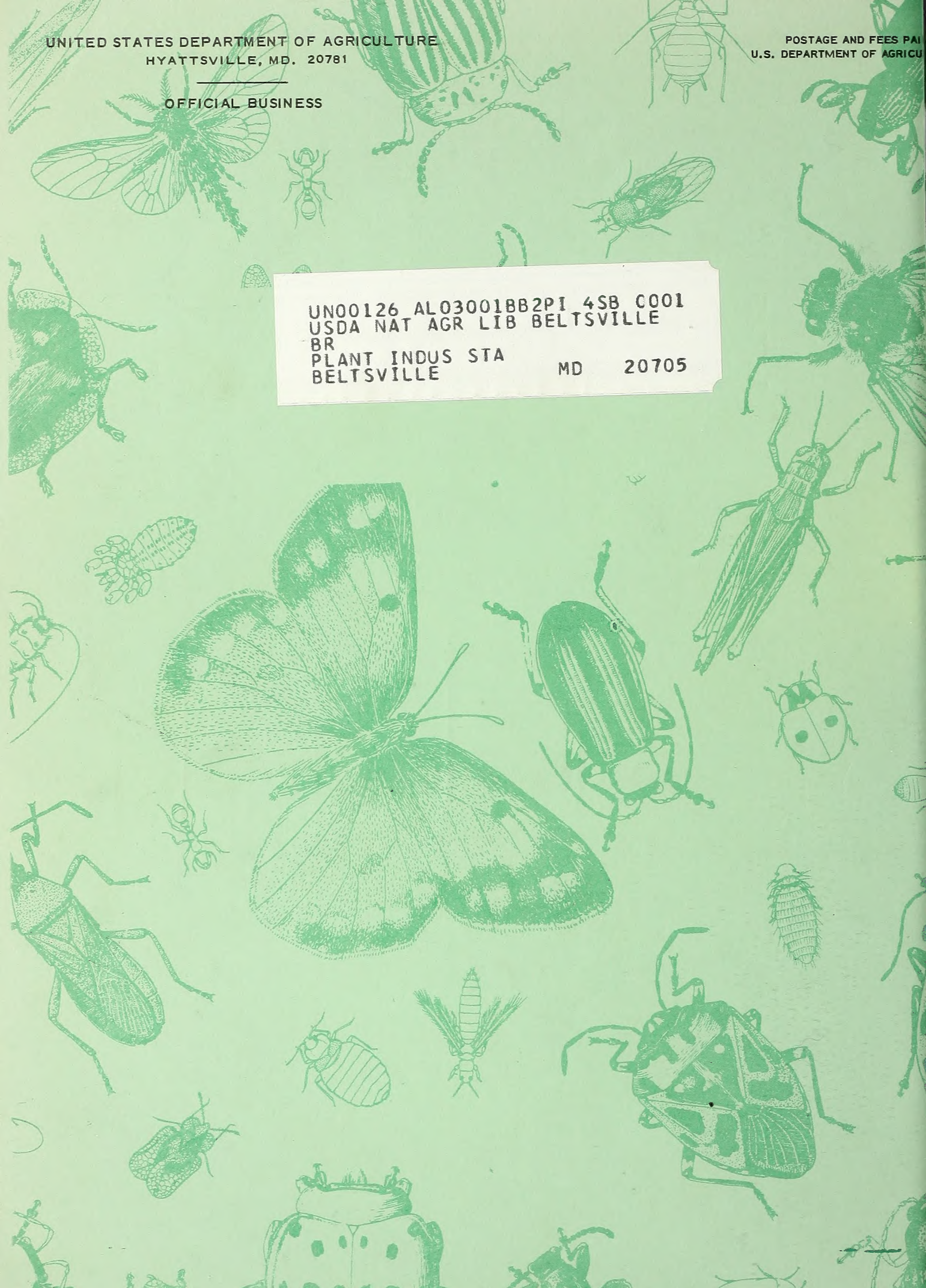
Note: The heaviest infestation was in Jackson County with 100% of ears infested and 39.5% of kernels damaged.

Table 6. Losses in yield of corn grown for grain due to birds and insects. Fall corn insect survey, Indiana, 1964. a/ b/

Area	Total corn yield 000's	Bird damage	000's	European corn borer	000's	Corn earworm	000's	Corn leaf aphid	000's	Angoumois grain moth	000's	Total losses	000's	000's
	Bus.	Pct.	Bus.	Pct.	Bus.	Pct.	Bus.	Pct.	Bus.	Pct.	Bus.	Pct.	Bus.	Dollars
NNW	42,549.8	.6	263.8	2.9	1,436.4	.5	247.7	11.2	5,547.8	.02	9.9	15.22	7,539.1	3,670.0
NNC	24,040.0	.1	29.9	3.1	926.9	.4	119.6	16.5	4,933.5	.01	3.0	20.11	6,013.0	6,915.0
NNE	18,674.3	.1	22.1	1.6	353.6	.1	22.1	17.2	3,800.8	.01	2.2	19.01	4,371.8	5,027.6
NW	39,839.6	.2	88.2	1.2	529.4	.1	44.1	4.5	1,985.4	0.	0.	5.90	2,603.0	2,993.4
NC	45,107.8	.1	53.2	1.0	532.6	.0	.5	14.3	7,615.6	0.	0.	15.40	8,201.4	9,431.6
NE	35,090.9	.0	1.5	1.1	518.1	.1	47.1	24.4	11,492.9	.04	18.8	25.64	12,076.9	13,888.4
SW	27,870.1	.2	58.7	1.0	293.4	.4	117.3	4.0	1,173.5	0.	0.	5.60	1,642.9	1,889.3
SC	15,800.6	.3	50.9	.4	67.9	.2	33.9	6.5	1,103.2	0.	0.	7.40	1,255.9	1,444.3
SE	35,890.7	.2	73.4	1.2	440.4	.3	110.1	1.0	367.0	0.	0.	2.70	990.8	1,139.4
SSW	36,283.1	.1	38.6	2.9	1,118.2	.4	154.2	3.0	1,156.7	.06	23.1	6.46	2,490.8	2,864.4
SSC	8,867.0	.1	9.6	3.6	346.6	.2	19.2	4.3	414.0	2.03	195.4	10.23	984.9	1,132.6
SSE	7,770.1	.0	.9	1.9	152.7	.4	32.1	1.4	112.5	.04	3.2	3.2	300.5	345.6
Averages and totals														
NN	85,264.1	.3	315.8	2.5	2,716.9	.2	389.4	15.0	14,282.1	.01	15.1	18.11	17,923.9	20,612.5
N	120,098.3	.1	142.9	1.1	1,580.1	.1	91.7	14.4	21,093.9	.01	18.8	15.65	22,881.3	26,313.5
S	78,841.4	.2	183.0	.9	801.7	.3	261.3	3.8	2,643.7	0.	0.	5.23	3,889.6	4,473.0
SS	52,920.2	.0	49.1	2.8	1,617.5	.3	205.5	2.9	1,683.2	.71	221.7	6.81	3,776.2	4,342.6
West	149,542.6	.3	449.3	2.0	3,377.4	.4	563.3	5.7	9,863.4	.02	33.0	8.30	14,275.8	16,417.2
Central	93,815.4	.2	143.6	2.0	1,874.0	.2	173.2	10.4	14,066.3	.36	198.4	13.28	16,455.2	18,923.5
East	97,426.0	.1	97.9	1.4	1,464.8	.3	211.4	11.0	15,773.2	.04	24.2	12.77	17,740.0	20,401.0
State	337,784.0	.2	690.8	1.8	6,716.2	.3	947.9	9.0	39,702.9	.19	255.6	11.45	48,471.0	55,741.7

a/ Monetary losses based on the average selling price of corn for the months of October, November, December, January and February - $1.15. Corn yields and price of corn supplied by Dr. Robert E. Straszheim of the Statistical Reporting Service, USDA.

b/ Bushel losses for all categories based upon the estimated yield in the absence of European corn borers and corn leaf aphids.



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